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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,955	12/18/2001	Roger Bernards	12329US02	6069

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EXAMINER
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AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/028,955

Applicant(s)

BERNARDS ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12,21 and 22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-12,21 and 22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-12 and 21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1-3,10,12 and 21-22 and rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier (6,162,503) in view of Yamada et al (JP 11029883).

Ferrier disclose a process for preparing roughened copper surface of a metal surface such as copper, wherein the copper surface is contacted with an adhesion promoting composition including a sulfuric acid as claimed pH adjuster, hydrogen

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peroxide, and benzotriazole (so called 1-H benzotriazole), which resembles the claimed 5-membered aromatic fused N-heterocyclic ring compound (col.3, lines 64-col.4, lines 22).

Ferrier discloses that a corrosion inhibitor used in the adhesion-promoting composition, wherein the corrosion inhibitor are selected from the group consisting of triazoles, benzotriazoles, tetrazoles and mixture of the foregoing (col.5, lines 31-35).

Therefore, Ferrier teaches the use of tetrazoles in the composition, which resemble as the claimed uniformity enhancer.

Ferrier also teaches that the copper surface is rinsed after the treatment with the adhesion-promoting composition (col.5, lines 3-5).

Ferrier fails to explicitly teach the claimed specific derivative of tetrazole such as 5-aminotetrazole.

However, Yamada et al teach a copper roughening composition including tetrazole derivatives such as 5-aminotetrazole for excellent adhesion capability of the treated copper surface (see abstract, solution).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to employ Yamada et al's teaching of using the specific tetrazole into Ferrier's composition for improving the roughening capability of the treated copper surface as taught by Yamada et al.

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5. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier (6,162,503) in view of Yamada et al (JP 11029883) and further in view of Adlam et al (5,861,076).

Modified Ferrier discussed in the paragraph 4 above but fails to teach contacting the uniform roughened copper surface with a post-dip solution comprising an azole or silane compound or a mixture thereof.

However, Adlam et al teach the use of coupling agents for improving the bonding of roughened copper surfaces to a resinous substrate. Suitable coupling agents include methacrylamide functional amines, and titanium and zirconium containing derivatives thereof (col.9, lines 15-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to use silane coupling composition as taught by Adlam et al following the treatment of the copper surface with the roughening composition of modified Ferrier for providing a treated copper surface having improved adhesion characteristics.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier (6,162,503) in view of Yamada et al (JP 11029883) above, and further in view of Noddin (5,910,255).

Modified Ferrier discussed above in the paragraph 5 but fail to teach the post dipping solution comprises aluminates.

However, Noddin teach that the coupling agents may include silane, aluminate

or zirconate (col.28, lines 47-55).

Therefore, it would have been obvious to combine the teaching of using either one of aluminate or zirconate or silane into modified Ferrier's composition because both the aluminate and zirconate are functional equivalent as taught by Noddin.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier (6,162,503) in view of Yamada et al (JP 11029883) above, and further in view of Bishop et al (6,284,309).

Modified Ferrier discussed in the paragraph 4 above but do not teach the inclusion of a copper salt in the roughening etchant composition.

However, Bishop et al teach a method for producing a copper surface with improved bonding by contacting the copper surface with a solution comprising an oxidizing agent, an acid, a copper complexing agent and a copper complex of copper salt, wherein the copper salt is present in an amount sufficient to precipitate copper from the solution for increasing the removal rate of copper (col.4, line 58-col.5, line 9).

Therefore, it would have been obvious to combine the teaching of using the copper complex of Bishop et al in to modified Ferrier's process for providing an improved adhesion properties of the treated copper surface by increasing the removal rate as taught by Bishop et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
April 13, 2006